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AUTHOR: William Earling

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A radical proposal for controlling the substance of routine information reports from overseas and getting them promptly to consumers.

DESIGN FOR JET-AGE REPORTING

William Earling

Transmitting information from its variegated and far-flung collectors to users in the complex intelligence community is necessarily a tremendously complicated business. In our present situation the natural complexity is compounded by our having been content to handle nonpriority materials by means evolved with little change from communication systems of the archaic past in separate departments and agencies. In 1900 the few copies of dispatches from abroad required in Washington could be supplied by carbon copies typed in an embassy and forwarded by ship pouch. The only improvements we have introduced for routine reports since then are to use mats or stencils instead of carbon paper and to forward them by air instead of by sea.

Given the vastly increased volume of reporting, this speed-up in means of transportation has not been able to prevent a net slow-down in the flow of information. Dispatches are still directed back to parent departments in Washington through many separate channels. There are departmental reviews, revisions, retypings, reproduction. Mail rooms and secretariats distribute them to other interested departments and agencies, which in turn route them by messenger to subordinate components. At every stage they queue up in front of logs and registers. The average transmission time for routine reports has come to be measured in months, and some stray documents take more than a year to make their way through the maze.

It is true that the community is not suffering critically from delay in receipt of priority information transmitted by radio and cable. Although much of our rapid communications system is also archaic, radical improvements have been

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made in some segments. Others are needed and possible, but this article will limit its concern to routine dispatches and information reports. For them we need a new, much faster system, though not necessarily so fast or so expensive as for cables.

The model intelligence reporting system would connect all components of the community through one integrated communications network. This network would have the capacity to move all intelligence from reporter to consumer within say, 24 hours. It would have standard, streamlined, automatic procedures for handling information at both ends of the line, with no room for backlogs, personal procrastination, or processing delay.

This model is something we can aim at, but we must begin at some modest and practical beginning. Let us then examine the design of a not too expensive system to speed the sluggish flow of information reports from overseas perhaps not fifty-fold but ten. Most analysts would find it not bad to be sure of getting all routine information, down to the lowest priority, within a week of its dispatch.

Triplicate Problem

The time required for the many processing steps that intervene between reporter and consumer, a time exponentially increased with volume as each report waits its turn at each processing station, is central to our problem, but it is not the whole problem. If we concentrate on the mechanics of getting pieces of paper from point to point as fast as possible without considering their substantive purport we are ignoring one side of the coin. That the current volume of reporting is outgrowing our ability to handle and use it effectively is manifest not only in unacceptable delays but in consumer complaints that they receive too many reports they do not need while failing to receive information they do need. Collecting components retort that consumers fail to let them know through standard evaluation procedures which of their reports are useless and to keep them informed through the standard placing of requirements precisely what is needed. A lack of communication between the two elements is evident.

It is clear that better guidance would improve the quality and reduce the volume of reporting; and this smaller volume of better material could in turn be handled more speedily. Formal collection requirements alone cannot do the job: the hungry analyst writes his requirements loosely in order to be sure of getting everything that bears on his subject, and the avid reporter in the field will find *some* bearing on *some* requirement in almost everything. Nor is the present consumer evaluation procedure sufficient to the purpose: in all of FY 1958 CIA, for example, received only 25 spontaneous evaluations of its CS reports, and of those rendered on particular request most were too slow coming—from an average six months up to almost two years in instances—to be useful as a basis for corrective action. What is needed is some new system for rapid and frequent user criticism of individual reports in order to point up good material and weed out at the source any information below the level of significance for the intelligence community.¹

A third facet of our problem, bearing both on the delay of information and on the analyst's dissatisfaction with what does show up in his in-box, is the practice of successive dissemination through organizational channels, through office or division and branch or section to the individual user. A central mechanized dissemination direct to individuals would save time, but Air Intelligence experiments with such an automatic system² indicate that a great deal of excess paper is pumped into the mill by a straight-faced, indiscriminating machine presented with imprecisely defined user requirements. If we can find some way to pinpoint in machine language exactly what each individual analyst requires, we can give him more nearly what he wants and give it to him faster.

¹ For earlier treatments of this problem see William P. Bundy, "The Guiding of Intelligence Collection," *Studies* III 1, p. 37, and Lowell M. Dunleigh, "Spy at Your Service, Sir," *Studies* III 2, p. 81.

² Described by Paul A. Borel, "On Processing Intelligence Information," *Studies* III 1, p. 32. For other aspects of mechanized Air Intelligence information handling see two articles in the series on "Developments in Air Targeting," Outten J. Clinard's "Data Handling Techniques," *Studies* III 2, p. 95, and Kenneth T. Johnson's "Progress and Future Prospects," *Studies* III 3, p. 53.

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The problem is then a three-fold one—to speed transmission and processing of reports, to improve by guidance the quality of reporting, and to make dissemination faster and more responsive to precise individual wants. These needs are interrelated in something of a vicious circle: delayed and indiscriminate distribution of reports to users breeds delay in getting evaluations of them back to the originators; user disinterest in outdated information extends to disinterest in commenting on it; lack of evaluative comment means more indiscriminate reporting and dissemination; a greater volume of reports produces still more delay. If we can significantly cut the transmission and processing time and better tailor our dissemination, users will better recognize their own interest in feeding back substantive appreciations to the collector; and the collector will be enabled by prompt user comment to stop wasting his precious manpower on marginal and submarginal operations and spurred to concentrate it on productive enterprises.

Design for Speed

The design here exhibited of a new system to cope with this triple problem was developed for experimentation on the CS reports of CIA. One of its central features is a roll of perforated paper tape. In its most familiar form it is the tape produced by the perforator unit of a standard M-19 teletype machine, with its rows of up to five holes in different position combinations, each representing a letter or function punched on the keyboard of the machine. When this tape is fed into the M-19 transmitter-distributor each perforation produces an electrical impulse in a channel corresponding to its position, and these impulses are used to key a page printer, or if desired produce an identical tape, at the other end of a telephone line or radio circuit.

A postwar development, the flexowriter, has adapted the tape communicator principle to the electric typewriter with its richer keyboard and smaller print. An increase in the number of impulse channels and corresponding perforation positions on the tape permits enough additional combinations to carry both capital and lower-case letters and some characters and functions, such as semicolons and tabulation, that the teletype machine cannot perform. Experimentally we

can use either the M-19 or a modified flexowriter in our design, but the M-19 is a bit crude for finished reports and the advantages of the flexowriter are largely vitiated by our need to stick to five channels in order to keep the tape compatible with other communications equipment. Both machines are too noisy. New tape-producing typewriters are being developed which will suit us better than either of these.

It is not that we are proposing electric transmission of all routine information reports, not yet at any rate. But we are borrowing many features from cable procedure, and our system will if necessary be immediately convertible, in whole or in part, to one using electric means.

The prepared tape can be automatically scrambled into a quite meaningless pattern of perforations. Thus encrypted, it is secure for radio transmission or, in our design, for air-mailing by whatever means is fastest. In practice, this means will probably be the unaccompanied State Department pouch if arrangements are made to get it on the first available plane without waiting for other material to accumulate: the State pouch cannot be bumped by the air lines and is not held up in customs. The tape should take sometimes as little as one day to reach its consignee, rarely more than three.

In the experimental procedure, then, a routine CS report is typed in the field, beginning with its operational cover sheet, on a tape-producing typewriter. The report will be in the form, a compromise between cable and dispatch format, in which the analyst will in a few days, we hope, find it on his desk; the first manual typing will be the only one in all but exceptional instances. Form headings and other repetitive material need not be so typed even here: a standard tape carrying them can simply be run through. Carbons or a mat in the printer will take care of local dissemination and record copies.

Encrypted and pouched, the tape bypasses in effect all registries in the field and in Washington—a carbon by the usual accompanied pouch will satisfy their needs—and is delivered with only a pause for automatic decryption to the CIA Cable Secretariat. The Secretariat operates day and night with its own courier service and whatever staff is necessary

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to get cables to their users within an hour or two of receipt. It has developed exceedingly effective procedures, and this bit of borrowing on our part from cable usage will be important both materially and psychologically. In the Secretariat the unscrambled tape is run through a printer, typing original and carbons of the operational cover sheet, mat and carbons of the report.

Responsibility for releasing the report, however, still rests with the controlling area desk, and that for indicating its dissemination belongs jointly to the desk and to CIA Central Reference. A Central Reference expert will be on duty in the Secretariat, and as soon as the mat is typed he will read it against user requirements and note on its face the proper recipients, as far as possible individual analysts. In the meantime carbons of the report, along with the original and carbons of its cover sheet, have gone to the area desk. If it can be released without further ado, it goes back immediately, assigned a number and showing the addressees prescribed by the desk, to be added to Central Reference's designations. If it requires consultation, comment, or correction, it is held up, possibly a day or so, for these. There will be check-up and inquiry about overdue releases.

Back in the Secretariat, the report number, dissemination instructions, desk comments, and minor corrections can easily be added either on the mat or to the tape, and the tape can either type a new mat or be fed by teletype to the consumer. At some future date the whole community may be sufficiently linked in a secure teletype network that most of the distribution can be accomplished by feeding the corrected tape into it. Considering the usual need for a courier at the receiving end of the teletype line, however, courier service from the Secretariat direct to individuals like that in present use for cables might be at least as fast for many addressees. When there are a large number of recipients at one location, as at the Pentagon, the tape and teletype might be used to print a mat at a central cable center there, say the Army Staff Communications Office, which could then make distribution to Army, ASA, Air Force, Joint Chiefs, and Secretary of Defense offices.

Field preparation of the tape may have taken a day, transportation as much as three, Secretariat processing possibly another, desk release and distribution perhaps a couple more. When the user analyst gets his information it will probably be no more than a week old. He could get it faster only with a large-scale and costly introduction of new radio and cable circuits with advanced terminal equipment. Field offices and their controlling headquarters desks will find not only their reporting but also their considerably greater volume of operational correspondence all moving at this speed.

Design for Guidance and Coordination

This speed alone will help feed back to the source an opinion on the usefulness of his information, but as we have shown, a new medium is needed for communication from user analysts to the originators of reports. We propose a new evaluation procedure, centered on a form bearing a deadline for return. It will call for a quick appraisal by the analyst of the value, credibility, and adequacy of each report in meeting his requirements, with ideas on how it could have been made more useful. We should like eventually also to get here the analyst's comments on its subject-coding, information which should in time build up to yield greater precision in stating requirements, making dissemination, and retrieving documents from storage.

Comments on subject-coding would not be possible under present procedures: information reports as now disseminated have not yet been coded. But in our system the Central Reference expert on duty in the Cable Secretariat who reads a report to determine its proper recipients could also assign it ISC and area codes. If the interposition of this step before dissemination seems an added complication when we are trying to get a report to its users as fast as possible, it would not really take extra time, and the pay-off in getting analysts to think in terms of the codes and in making Central Reference aware of analysts' criteria for coding should be enormous.

The evaluation form will accompany reports sent to those analysts whose feedback is worth exploiting, the specialists concerned with the subject matter reported, those responsible for writing collection requirements on it, those whose work

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will suffer if information is not adequately retrievable because of imprecise coding. It stands to reason that their cooperation will be quickly rewarded by receipt of fewer reports which are of no interest to them, by retrieval of filed materials they need in research, and by the more direct and effective contact with collectors made possible by their responses.

The form will be designed for simple answers and multiple choice checks both for the convenience of the analyst and to facilitate later processing. In past experience, more than half of the elaborate old evaluation forms are returned with check marks only, no substantive comments whatever. For the most part, therefore, punched-card processing of the new forms will eliminate carbon or reproduced copies and obviate manual sortings and distribution. One operator can punch six to eight hundred forms onto cards in a day. All derived products, except those including lengthy analyst comments, will be tailor-made machine tabulations.

Feedback for Coders

Every theoretical discussion of retrieval problems brings out the inevitable human limitations in the coding process.^{*} Central Reference document analysts are not omniscient universal geniuses; in assigning the apparently pertinent codes they are bound to overlook or not to be aware of angles under which retrieval might in the future become necessary. This is the primary criticism leveled at the present library system by personnel using it. The Intelligence Subject Code, especially with the refinement of its current revision, will be a splendid instrument, useful exactly to the point to which coders properly foresee the headings under which material may need to be recovered, but no further.

The better and more widely known the ISC, the more it is directly used and contributed to by experts in their various fields, the better the retrieval system. If when its revision is complete we could provide a space on the evaluation form for analysts to suggest coding in other categories than those assigned by Central Reference, analysts would become more fa-

^{*}See for example George W. Wright, "Toward a Federal Intelligence Memory," *Studies* II 3, p. 7, and Paul A. Borel, "On Processing Intelligence Information," *Studies* III 1, p. 25.

miliar with the coding systems, and any analyst who received a report could take care of his own interests by thus nominating the appropriate codes.

Mechanically, the additional entries could be referred to Central Reference coders in weekly tabulations. These could show report numbers, the additional codes proposed for each, and the names of the contributing analysts. They could be arranged by document or ISC number or in whatever order would be most conducive to integrating them into the system after any necessary discussion with the proponents.

Once this feedback process had been under way for some time and analysts had become used to it, it is hoped they would develop such confidence in the ability of the library—particularly as mechanization provides increasingly reliable and rapid service—to retrieve what they need that they would be willing to dispense with the bulk of their own holdings of indexed documents. Without participation in the coding process we believe this confidence could not be established.

Feedback for Disseminators

If we are to achieve the speed and efficiency of mechanical dissemination from a central point direct to individual analysts, their individual requirements, as we have noted, will have to be stated with precision and kept up to date by a feedback system suitable for mechanization. Under such a system, dissemination can take place by ISC subject codes, and the assignment of codes to a report would automatically indicate its dissemination. But coded requirements as well as coded reports are a prerequisite for such a mechanized process.

The analyst will be properly skeptical that his subtle needs can ever be fully stated in machine language, and certainly some unusual spot requirements will have to be handled outside any mechanical system. But most requirements can be sufficiently codified to take care of the great routine bulk of dissemination. A codified statement of an analyst's requirements may be derived in the first instance by tabulating his response over a period of some months to key questions on the evaluation form for all the reports he received, along with their assigned subject codes. Document analysts could trans-

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late this tabulation into a tentative Statement of Requirements, to be refined in discussion with the analyst concerned. The resultant agreed Statement of Requirements would be used as the basis for current dissemination to him, and it could be kept up to date by the continuing feedback of his evaluations.

This feedback system, properly used, will tend to give the analyst and his supervisor direct control over the volume of information delivered to his in-basket. The supervisor is an interested party because of his responsibility for an equitable distribution of workload to his subordinates, in practice a most difficult task. Most supervisors carry their own workloads and do not inspect their subordinates' in-baskets at regular intervals. Tabulations of the evaluation form by name could provide them every week or at any convenient interval with a list of the reports their subordinates took in and their reactions to them. This tool might be a considerable aid to proper workload distribution.

Feedback for Collectors

Most of the questions on the form will be designed to guide the collector. Headquarters can use the answers, incorporated into punched card systems covering operational data, sources, project numbers, and lists of requirements, to furnish the field, in tabulations by station or base and source cryptonym, the evaluations placed on all of their reports, matched up against requirements levied on the station. Headquarters desks and staffs will be able, in their planning and control functions, to use not only these but other tabulations, for example listings by project and source of reports and their evaluations, lists by requirement numbers of evaluated reports responsive to requirements, and a variety of statistical compilations. If evaluations run consistently high on a low-cost source, there will be little question about the renewal of his operation. Adverse reactions will provide an indication to the desk and staff that a situation needs to be looked into. User rejections will not be drowned in the stack of paper surfaced once a year in the project renewal process, but will lead to an examination of all pertinent facts and the prompt closing of marginal operations. Desk and staff personnel will be

freed from the routine bookkeeping chores now required to keep track of field reporting.

From Prototype to Production Model

This design for speed and guidance has undergone limited tests on the reporting of a major field station, and it has been found to produce at least the short-term benefits anticipated. It is still in the prototype stage, however, subject to modification in more extensive testing planned as equipment becomes available. It may be that new technological developments, for example photographic or magnetic tape encryption processes now being investigated, will make major changes desirable. In any case it will require adaptation to varying local needs in the field before it can be generally applied to the reporting of even this Agency.

There will be many obstacles to the integration of the reporting of the whole community in a single system. They will have to be tackled slowly, and piecemeal. The easiest beginning will probably be on the receiving end, with the extension of rapid dissemination and the application of some better evaluation system in those agencies, notably Air Intelligence, that employ the Intelligence Subject Code. Efforts are now under way to standardize the format of all community reporting. For all its tentative and limited nature, our design does provide a basic concept and may embody some specific features that can lead to an ultimate integrated reporting system.